Welcome to “The Integrated Truck Program”

• If the webinar system does not call you automatically, please dial 1-800-201-2375 and enter passcode 710737
• The webinar will begin at 1:00 EDT and last approximately 90 minutes
• Presentations by:
  – **Susan Alt**, Vice President of Customer and Industry Relations, Mack and Volvo Trucks North America
  – **Lance Hagler**, Director of Safety, Con-way Freight
  – **Tom Kearney**, Freight Operations Program, Federal Highway Administration
• Audience Q&A – final 20 minutes of the seminar, during the presentations you may type questions into the chat area of the screen
• After the seminar the presentations will be posted on the TIMTC website at [www.freightmobility.org](http://www.freightmobility.org)
The TIMTC Mission:

• To improve the knowledge base of both private and public sector stakeholders of freight transportation issues and possible technology solutions

• To ensure a working forum of industry stakeholders that can coordinate existing and planned research initiatives
TIMTC is focused on Intelligent Transportation Systems (ITS) Programs, including:

- Truck Connected Vehicle Technologies
  - Imminent Crash Safety Focused Technologies
  - Enhanced Mobility Applications
- Smart Roadside Initiative (SRI)
  - Truck Parking
  - Universal Truck ID
  - Virtual Weigh Station/E Permitting
  - Wireless Roadside Inspections (WRI)
TIMTC 2011 Annual Meeting
October 17-18, 2011

• Will be held in conjunction with ATA’s MC&E at the Gaylord Hotel and Convention Center in Dallas, Texas
• Attend business and educational sessions, tour ATA’s Exhibit Hall and network with motor carrier executives and industry suppliers
• Live Nemo Show Broadcasts Monday and Tuesday
• Speakers will include:
  – Anne S. Ferro, Administrator, FMCSA
  – Ronald Medford, Deputy Administrator, NHTSA
  – Greg Nadeau, Deputy Administrator, FHWA
  – Chad England, Chief Operating Officers, C.R. England
  – Doug Hathaway, Vice President, Transportation Division, Maxum Specialty Insurance Group
  – Major Ron Cordova, New Mexico Department of Public Safety
  – Plus other top industry executives

• FREE REGISTRATION available at www.freightmobility.org
Examples of ITS in progress

Susan Alt
Vice President, Strategy & Industry Relations
Intelligent Transportation Solutions will benefit society as a whole

- Improves transportation safety, mobility, & homeland security and enhances productivity through the use of advanced IT and communications technologies.

- Common communication standards are needed
  - Balanced with OEMs liability for its product
    - Not in competition for HOW data communicated, but WHAT is communicated

- Development of communication standards must be done via a collaborative effort
  - Businesses are in the habit of making money via a differentiated value added solution!
Heavy Trucks and ITS make good business and environmental sense

- Heavy Duty Truck OEMs & SAE have developed common communication & diagnostic standards (e.g. SAE J1939) in Commercial Vehicles
  - Result: Any brand of truck can “talk” to another
- Practical: In NA, med/heavy trucks build 300k/year, cars produce 6,000k/year
- Environmentally, Heavy trucks consume the vast majority of commercial trucks’ fuel
  - Minimal reductions to improve FE via ITS have dramatic impact

![Fuel Consumption](image)
Many can benefit from a “Connected Truck”

- **Fleet operators**
  Improved transport efficiency and cost optimization, driver time management, cargo management & security/safety

- **Drivers & families**
  Keeping in touch with messaging

- **Cargo owner**
  Monitoring of location & status etc.

- **3rd party service & software companies**
  Integration of 3rd party solutions

- **Authorities**
  Road charging, emission control, dangerous goods monitoring, e-call (e-safety), anti-theft solutions etc.

- **Finance/insurance companies**
  Focus on minimizing risk by monitoring & control – security & usage

- **Truck manufacturers/dealer**
  In order to manage up-time, increase parts & service sales and improve customer relationship management
ITS as an industry helping our economy in other ways.....

Intelligent Transportation Employment to Expand in U.S., Group Says

By Tim Higgins - Aug 10, 2011 6:00 AM ET

The intelligent transportation system industry, the information and communication technologies that reduce traffic congestion and improve safety, may expand U.S. employment by as many as 8,400 jobs annually through 2015, an industry group said.

The Intelligent Transportation Society of America, a Washington D.C.-based advocacy group for technologies in ground transport, said the industry generated $48 billion in revenue in 2009 in the U.S. and should increase $2.7 billion to $4.2 billion annually through 2015, the organization said.
Volvo has been actively research and developing ITS solutions across the globe

- **USA:**
  - Trusted Truck®
  - CVII

- **Europe:**
  - CVIS, SAFESPOT, CAR 2 CAR Comm. Consortium
Trusted Truck®

Fleet Operations Center

Trusted Truck® Management Center (TTMC)

Government Systems

Trust

Bypass Notification

Inspection Station

encrypted Section

Wireless Link
The Inspection Zone

1. Bypass (Trusted)
   - Trusted Truck® allowed to bypass station

2. Enter as general truck population (Not Trusted)

3. Pass
   - Passed weight check and did not get selected for manual inspection

4. Manual Inspection
   - Selected by officers to be inspected
Trusted Truck®

- Deploy “Wireless Roadside Inspections” to increase safety without increasing congestion
- Trucks send critical data to a virtual inspection site
- Research project funded by DOT/RITA through NTRCI
New York State DoT:
Commercial Vehicle Infrastructure Integration (CVII)
CVII – Commercial Vehicle Infrastructure Integration

- Sponsors:
  - NYS DOT & I-95 Corridor Coalition

- Objective:
  - Develop and Test CV VII compliant OBE system including HMI for communication of transportation related information
  - Communication tested by 5.9 GHz DSRC with SAE J1708 CV Databus

- Test sites:
  - Greensboro, NC
  - Long Island Expressway & Spring Valley Corridor, NY
CVII Services – V2I

**Wireless Driver Identification and Verification**

- Driver inputs identification information; it’s sent to a roadside application
- Roadside application sends a message to the driver indicating that his/her CDL is inactive, revoked, or suspended
- Driver is unable to start the commercial vehicle, if the driver’s CDL is inactive, revoked, or suspended
CVII Services – I2V

**Roadside to Vehicle; Generic Communications**

- Back-end application sends network-based static roadside signage information to the vehicle.
- Back-end application sends network-based dynamic travel information to the vehicle.
- Roadside application sends localized time sensitive dynamic travel information (workzones, OS/OW temporary restrictions, geofencing warnings, etc) to the vehicle.
CVII Services – V2I

**Vehicle to Roadside Generic Communications**

- Vehicle sends standard anonymous probe data (i.e. current SAE J2735 probe message) to a back-end application
- Vehicle sends truck related anonymous probe data to a back-end application
- Back end application displays probe data on a GIS map
CVII Services – V2V

**Maintenance Vehicle to Commercial Vehicle Communications**

- A moving maintenance vehicle broadcasts a heartbeat-like message with its vehicle type, position and heading.
- A truck following the snow plow receives and displays a warning to the driver about the snow plow ahead.
CVII Future

• Future Actions (near term)
  – Heavy vehicle to light vehicle communication
  – Priority safety applications

• Future Actions (longer term)
  – Partner with Large Carriers for long term field tests/pilot program
  – Additional RSE deployments
  – Additional applications: truck parking, overturn warning, tolling, restricted routing/geo fencing
  – Additional communication pathways (non-DSRC)
Concept of Connected Vehicles

OBE – On Board Equipment
RSE – Road Side Equipment

Network/System Management Center

Private Sector
OEMs, Private Companies, Subscription Services, Fleet Management, etc.

Public Sector

Green = NYS CVII
Red = Others/TBD

DSRC @ 5.9 GHZ
Other initiatives in Europe
In summary...

- ITS important for us as a business and as citizens across the globe
- Volvo is actively engaged in research with Commercial Vehicles
  - I-95 Corridor Coalition, NY DOT
  - U of Tenn, NTRCI
  - Europe
- More “bang for the buck” in environment safety and security with Commercial vehicles vs. passenger cars
Con-way

SAFETY PRINCIPLES

[1] We expect everyone to return home safely.

[2] We are personally accountable for our safety and the safety of others.

[3] We have the courage to intervene and change behavior to ensure a safe work environment.

[4] We believe all incidents are preventable. We will measure, learn and share information from incidents and near misses to continuously improve.

[5] We accept safe behavior as a non-negotiable condition of employment.

At Con-way, our uncompromising commitment to Safety is fundamental to everything we do.
Con-way Freight is an LTL carrier focused on a world-class safety journey.

The Network
- 289 Service Centers
- 123 Zone Operations
- 65 Consolidation Centers
- 9,304 Power Units
- 14,000 Drivers
- Pick-up and delivery vs. linehaul
Integrated Truck Technologies – What We’ve Done…

Integrated Vehicle Based Safety Systems (IVBSS)

- Partnership with University of Michigan Transportation Research Institute, funded by Research and Innovative Technology Administration (RITA)

- Installed various safety technologies and cameras on trucks

- Technology fed behavioral data to central database
Integrated Truck Technologies – What We’ve Done…

Installed permanent safety technology on 1600 units

- Front collision warning, lane departure warning, roll stability
- $5.4 million investment
- Not currently connected to our systems
**Integrated Truck Technologies – Where We’re Going…**

**Electronic On-Board Computer (EOBR) approach**

| EOBR records data...we connect with the vehicle | Capable of recording hours of service, fuel usage, speed, maintenance-related information, etc. |

**Driving behavior is monitored**

| Behavior-based safety approach | Post crash investigation | Accountability, Rewards and developmental training |

**By connecting to an EOBR equipped unit, we access everything in the vehicle**
Integrated Truck Technologies – Where We’re Going...

- **Real-time** behavior tracking
  - Connectivity between trucks and overall system
  - Safety technology detects the “world around the truck”
  - World class safety culture requires immediate intervention for unsafe behavior
  - Better targeting of unsafe drivers and behaviors
  - Identification of trends
Connected Vehicle will produce the next generation of onboard safety technologies

- Vehicles will communicate with each other (V2V)
  - Traditional systems are one-way communication to the driver
  - V2V is two-way communication to everyone around the driver
- Eliminates false warnings produced by traditional radar-based technologies
Integrated Truck Technologies – Operational Approach…

Technology provides tools for decision support
- Allows us to connect our resources
- Trucks, handhelds, drivers, service centers, etc.

Connectivity leads to network optimization
- Lower costs
- Improved customer service
- Efficiency
- *Greener* operation

The better we are at connecting our vehicles with the world around them, the better service we provide
Update on the USDOT Smart Roadside Initiative

Tom Kearney, Freight Operations Program, Federal Highway Administration
“Smart Roadside” – The Concept

Smart Roadside will be deployed at strategic points along commercial vehicle routes to improve safety, mobility and efficiency of truck movement and operations on the roadway.
“Smart Roadside” – Purpose and Need

- Too many legally loaded commercial motor vehicles are queued up at inspection stations;
- Unnecessary delay in the US Supply Chain results;
- Truck Travel Demand is increasing;
- Enforcement Resources are strained;
- More effective decision making by enforcement officials as to what vehicles require more extensive inspections and compliance checks would significantly reduce this delay.
The Smart Roadside Program allows trucks and drivers to be screened using wireless communication between the vehicle and the infrastructure while traveling at highway speeds.

Regulatory functions can be employed while not interrupting commercial vehicle operations.

Safety is improved by eliminating stop and go traffic.

Data can provide fleet managers insights into the “real-time” status of their vehicles and cargo.
"Smart Roadside" – Initial Focus

- Tractor
  - Transponder ID
  - USDOT Number
  - License Plate Number
  - VIN
- Driver
  - Driver ID
  - Driver Hours of Service
- Vehicle Probe Application
  - Vehicle Brakes
  - Vehicle Tires
  - Vehicle Lighting
  - Vehicle Safety Belts
  - Vehicle Location
- Tractor & Trailer
  - Truck Dimensions
  - Trailer ID(s)
  - Shipment ID
- Infrastructure Sensor (WIM)
- Truck Parking Lot
- Back Office System
- E-Screening Pass/Fail
- Truck Size & Weight Pass/Fail
- WRI results
- Parking Space Availability

System of Interest
“Smart Roadside” – Current Status

1. “Smart Roadside” is identified as a “priority application” in the “ITS Strategic Research Plan: 2010-2014”;
2. A multi-year project is supported through the ITS Strategic Plan that will support development of a prototype application;
3. “Smart Roadside” is an component of the Vehicle-to-Infrastructure” (V-I) element of the “Connected Vehicle” Research Initiative.
The Connected Vehicle Initiative
## “Smart Roadside” – Current Project Schedule

<table>
<thead>
<tr>
<th>Activity</th>
<th>Completion Date</th>
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</thead>
<tbody>
<tr>
<td>Project and Systems Engineering Management</td>
<td>Ongoing</td>
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<td>Stakeholder Outreach</td>
<td>Ongoing</td>
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<td>Applications Assessment of Deployed Systems</td>
<td>March 2011</td>
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<tr>
<td>Applications Assessment of Research Projects</td>
<td>March 2011</td>
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<tr>
<td>SRI Concept of Operations</td>
<td>October 2011</td>
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<td>SRI System Requirements</td>
<td>November 2011</td>
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<td>SRI System Architecture</td>
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<td>SRI Component-Level Design</td>
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<td>SRI Development and Testing</td>
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<td>SRI Build and Install</td>
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<tr>
<td>SRI Prototype Testing</td>
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<tr>
<td>SRI Final Documentation</td>
<td>October 2012</td>
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“Smart Roadside” – Future Implementation
“Smart Roadside” – Contact Information

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